

# Structural hollow sections

Environmental Product Declaration (EPD)  
In accordance with ISO 14025 and EN 15804:2012+A2:2019

S-P-02241, version 1.1  
UN CPC 412  
Programme: The International EPD<sup>®</sup> System, [www.environdec.com](http://www.environdec.com)  
Programme operator: EPD International AB  
Published: 2020-09-14  
Revised: 2022-04-01  
Valid until: 2027-04-01



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# 1. SSAB

## 1.1 DESCRIPTION OF THE ORGANISATION

SSAB is the leading steel tube manufacturer in the Nordic countries with a broad selection of products to meet the needs of the construction, automotive and manufacturing industries. SSAB is also one of the leading suppliers of steel infrastructure products in Europe especially for foundation construction. Extensive range of products include structural hollow sections, precision tubes, cold-formed open sections, steel piles, retaining walls, safety barrier systems, trapezoidal sections and water mains. We expertise in high-strength steels and aim at exceeding expectations by continuously developing our operations and products keeping customer's business on focus.

## 1.2 PRODUCT-RELATED OR MANAGEMENT SYSTEM-RELATED CERTIFICATIONS:

- Quality management system certification (ISO 9001:2015 9 1 6 59-2011-AQ-FIN-FINAS) and Environmental management system certifications ISO 14001:2015 (9 1 6 60-2011-AE-FIN-FINAS)
- Factory production control based on requirements of EN 1090-1:2009+A1:2011 under system 2+

## 1.3 NAME AND LOCATION OF PRODUCTION SITE(S):

Structural hollow sections are manufactured at SSAB's production sites in Hämeenlinna and Pulkila, Finland. Input material for the production of structural hollow sections is manufactured at SSAB's mill in Raah.

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## 2. Product information

### 2.1 PRODUCT NAME

Structural hollow section

### 2.2 PRODUCT IDENTIFICATION

Cold formed welded structural hollow sections beyond standards EN 10219-1, EN 10219-2, EN 10219-3

### 2.3 PRODUCT DESCRIPTION

- STRENX® TUBE - Structural hollow sections for stronger, lighter, safer, more competitive and more sustainable structures.

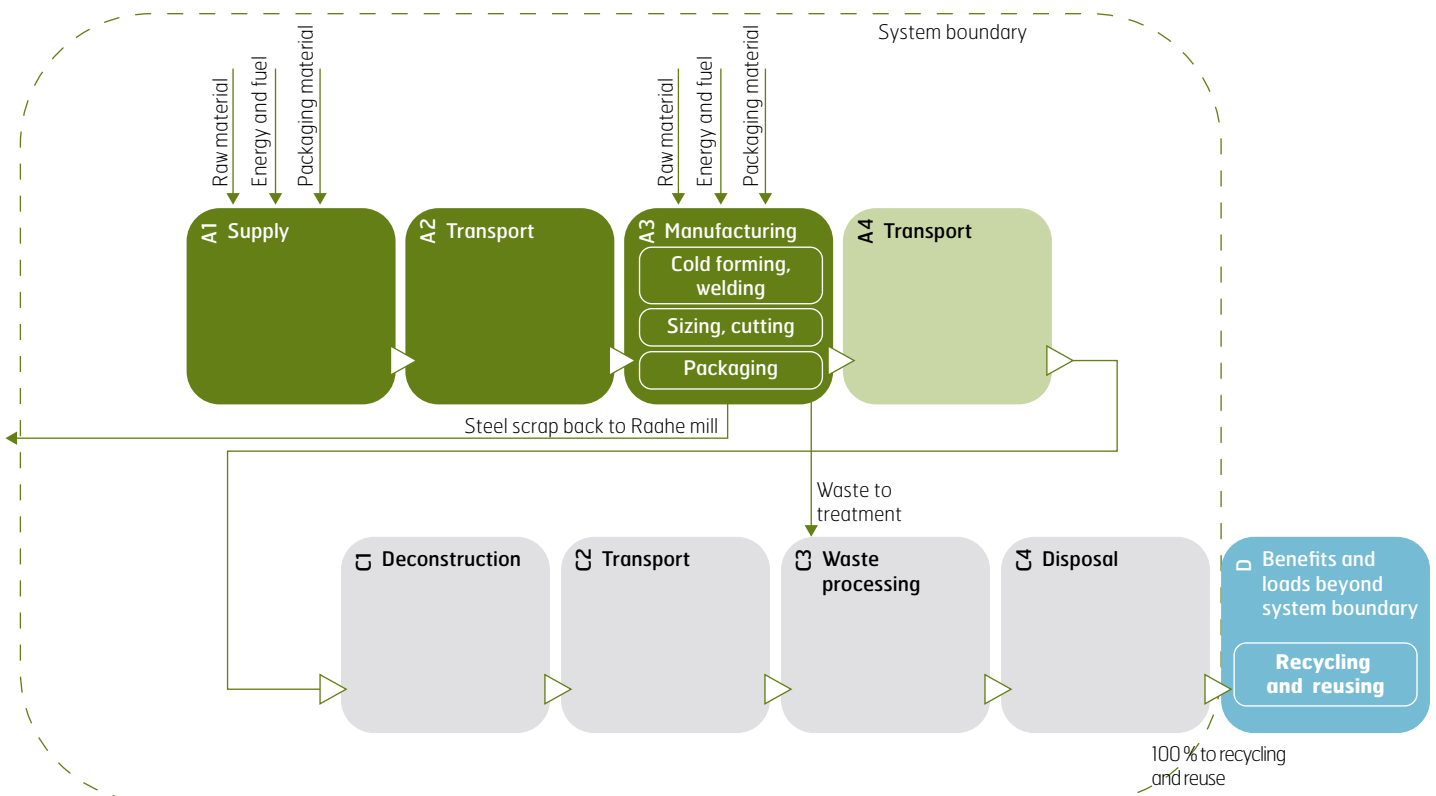
- SSAB DOMEX®TUBE - A wide range of structural hollow sections that deliver excellent forming, machining and welding performance.
- SSAB WEATHERING TUBE AND COR-TEN® TUBE - Corrosion-resistant hollow sections to minimize total lifecycle costs thanks to low or zero maintenance needs. COR-TEN® - is a licensed brand and a part of the SSAB Weathering steel family.
- EN 10225-4 – Welded hollow sections for fixed offshore structures

### 2.4 UN CPC CODE

4128

### 3. LCA information

- **Declared unit:** 1 ton of product
- **Reference service life:** N/A
- **Time representativeness:** The data is collected from year 2019. The database data are from 2021.
- **Database(s) and LCA software used:** SimaPro (release 9.2.0.2), and database ecoinvent 3.7.
- **Description of system boundaries:** Cradle to gate with options, modules C1–C4, and module D (A1–A3, C, D and additional modules). The additional module is A4.
- **Excluded lifecycle stages:** Modules A5 and B1–B5 are not assessed. In B1–B5, only minimal maintenance is required. The excluded modules are very dependent on particular scenarios for a specific building or construction work.
- **Numbers:** Numbers are expressed using the French style (comma as the decimal separator).
- **System diagram:** See illustration below.
- **LCA practitioner:** Ecobio Oy, info@ecobio.fi  
Explanatory material can be obtained from the EPD owner and/or LCA practitioner.  
Electricity in module A3 covers more than 30% of the total energy in modules A1–A3. Therefore, the energy sources and climate impacts as g CO<sub>2</sub> eq./kWh. must be informed.
- **Energy sources for electricity:** Market priced electricity with the following energy sources: 20% renewable, 51% nuclear and 29% fossil fuels and peat.
- **Climate change impact of electricity:** 265 g CO<sub>2</sub>-eq./kWh.
- **Cut-off rule:** 1% cut-off rule was applied for input flows in the inventory. The material used is as up-to-date as possible and at most five years old for producer specific data and at most ten years old for generic data.
- **Allocation:** Steel scrap produced in module A3 is treated as co-product and environmental impacts are allocated for it based on economic values.
- **Use of secondary material:** Steel production is based on the use of iron ore as a raw material. However, SSAB uses approximately 20% of scrap steel in conjunction with steel production in the Nordics. The use of raw materials and energy has been optimized in steel production.



**MODULES DECLARED, GEOGRAPHICAL SCOPE, SHARE OF SPECIFIC DATA  
(IN GWP-GHG INDICATOR AND DATA VARIATION):**

	Product stage		Construction process stage			Use stage							End of life stage				Resource recovery stage	
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential	
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Modules declared	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x	
Geography	EU27	EU27	EU27	EU27	-	-	-	-	-	-	-	-	EU27	EU27	EU27	EU27	EU27	
Specific data	>90%					-	-	-	-	-	-	-	-	-	-	-	-	
Variation – products	not relevant					-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	not relevant					-	-	-	-	-	-	-	-	-	-	-	-	-



## 4. Content information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Hot rolled steel	1000	2,6 %	0
<b>TOTAL</b>	<b>1000</b>	<b>2,6 %</b>	<b>0</b>

Packaging materials	Weight, kg	Weight-% (versus the product)
Steel straps	1,0	0,1
Timber	3,9	0,4
<b>TOTAL</b>	<b>4,9</b>	<b>0,5</b>

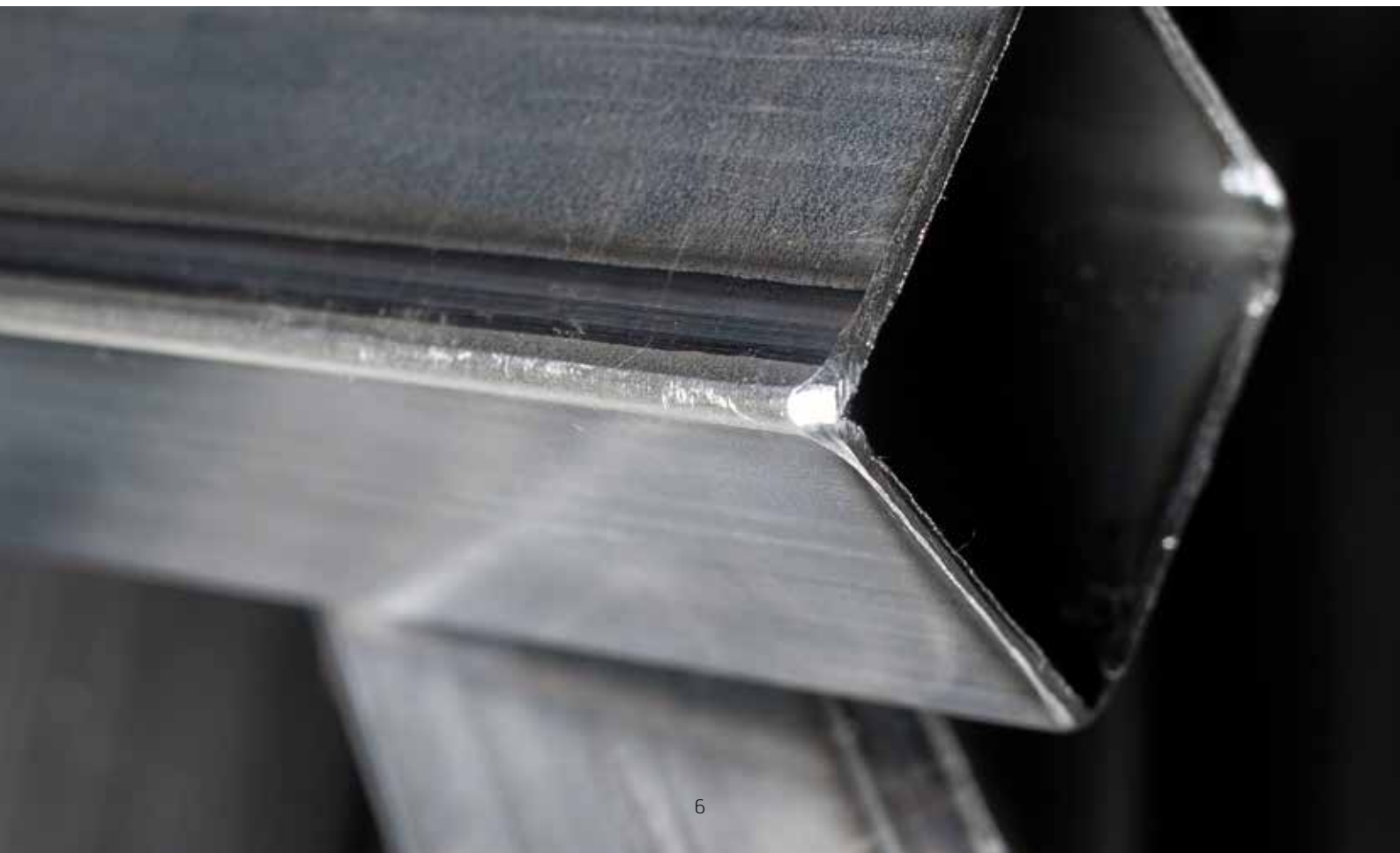
The structural hollow sections do not contain substances which exceed the limits for registration with the European Chemicals Agency regarding the “Candidate List of Substances of Very High Concern for Authorisation”.

### 4.1 PACKAGING

**Distribution packaging:** The products are packed with steel straps to bind the products. In some cases, also wood is used to protect the packed products.

### 4.2 MANUFACTURING

The products manufacturing processes consist of the following phases: tube manufacturing in longitudinal welding lines and packaging.



## 5. Environmental information

### POTENTIAL ENVIRONMENTAL IMPACT – MANDATORY INDICATORS ACCORDING TO EN 15804

Results per 1 ton of structural hollow sections											
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	C1	C2	C3	C4	D
GWP-fossil	kg CO <sub>2</sub> eq.	2,30E+03	1,58E+01	3,09E+01	2,35E+03	6,74E+01	1,85E-01	4,53E+00	2,22E+01	0,00E+00	-1,71E+03
GWP-biogenic	kg CO <sub>2</sub> eq.	1,92E-01	3,79E-02	-1,15E+01	-1,13E+01	1,24E-01	5,57E-03	9,50E-03	-1,34E+00	0,00E+00	-1,21E+00
GWP-luluc	kg CO <sub>2</sub> eq.	5,70E-01	5,33E-03	1,90E-01	7,65E-01	2,44E-02	2,02E-04	1,26E-03	2,37E-02	0,00E+00	1,63E-01
GWP-total	kg CO <sub>2</sub> eq.	2,30E+03	1,59E+01	1,96E+01	2,34E+03	6,75E+01	1,90E-01	4,54E+00	2,09E+01	0,00E+00	-1,71E+03
ODP	kg CFC 11 eq.	1,21E-10	3,60E-06	1,79E-06	5,39E-06	1,52E-05	5,14E-09	1,06E-06	3,01E-06	0,00E+00	-8,51E-13
AP	mol H <sup>+</sup> eq.	6,34E+00	6,34E-02	1,28E-01	6,54E+00	6,37E-01	5,35E-04	1,87E-02	1,91E-01	0,00E+00	-3,26E+00
EP-freshwater	kg P eq.	1,65E-03	1,06E-03	7,60E-03	1,03E-02	3,99E-03	9,69E-05	2,95E-04	1,45E-02	0,00E+00	-3,83E-04
EP-freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq.	6,12E-04	3,94E-04	2,81E-03	3,82E-03	1,48E-03	3,58E-05	1,09E-04	5,36E-03	0,00E+00	-1,42E-04
EP-marine	kg N eq.	1,61E+00	1,94E-02	2,43E-02	1,66E+00	1,72E-01	9,60E-05	5,78E-03	6,06E-02	0,00E+00	-5,23E-01
EP-terrestrial	mol N eq.	1,74E+01	2,12E-01	2,57E-01	1,79E+01	1,90E+00	8,53E-04	6,32E-02	6,78E-01	0,00E+00	-5,21E+00
POCP	kg NMVOC eq.	4,77E+00	6,48E-02	7,75E-02	4,92E+00	5,32E-01	3,30E-04	2,03E-02	1,81E-01	0,00E+00	-2,48E+00
ADP-minerals & metals*	kg Sb eq.	3,73E-03	5,71E-05	2,31E-04	4,02E-03	1,72E-04	5,80E-07	1,06E-05	2,77E-03	0,00E+00	-3,18E-03
ADP-fossil*	MJ	2,54E+04	2,40E+02	6,90E+02	2,63E+04	1,00E+03	2,05E+00	7,06E+01	3,08E+02	0,00E+00	-1,50E+04
WDP	m <sup>3</sup>	-1,43E+02	6,55E-01	8,57E+00	-1,34E+02	2,74E+00	1,70E-01	2,25E-01	3,89E+00	0,00E+00	-2,27E+02
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption										

\* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

### POTENTIAL ENVIRONMENTAL IMPACT – ADDITIONAL MANDATORY INDICATORS

Results per 1 ton of structural hollow sections											
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	C1	C2	C3	C4	D
GWP-GHG <sup>1</sup>	kg CO <sub>2</sub> eq.	2,30E+03	1,57E+01	3,08E+01	2,35E+03	6,69E+01	1,83E-01	4,49E+00	2,20E+01	0,00E+00	-1,65E+03
Particulate matter emissions	Disease incidence	5,93E-05	1,10E-06	9,72E-07	6,14E-05	4,84E-06	8,98E-08	4,08E-07	3,31E-06	0,00E+00	-5,25E-05
Ionising radiation, human health	kBq U235 eq	1,85E+01	1,25E+00	2,60E+01	4,57E+01	5,09E+00	5,40E-02	3,62E-01	3,19E+00	0,00E+00	3,85E+01
Land use related impacts / soil quality	Pt	1,34E+03	1,65E+02	1,12E+03	2,62E+03	8,35E+02	3,16E-01	8,09E+01	5,89E+02	0,00E+00	2,65E+02

<sup>1</sup> The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

## USE OF RESOURCES

Results per 1 ton of structural hollow sections											
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	C1	C2	C3	C4	D
PERE	MJ	7,44E+02	3,23E+00	3,22E+02	1,07E+03	1,17E+01	3,22E-01	8,61E-01	5,02E+01	0,00E+00	8,82E+01
PERM	MJ	0	0	5,35E+01	0	0	0	0	0	0	0
PERT	MJ	7,44E+02	3,23E+00	3,75E+02	1,07E+03	1,17E+01	3,22E-01	8,61E-01	5,02E+01	0,00E+00	8,82E+01
PENRE	MJ	2,54E+04	2,41E+02	7,38E+02	2,63E+04	1,01E+03	2,45E+00	7,10E+01	3,44E+02	0,00E+00	-1,50E+04
PENRM	MJ	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	2,54E+04	2,41E+02	7,38E+02	2,63E+04	1,01E+03	2,45E+00	7,10E+01	3,44E+02	0,00E+00	-1,50E+04
SM	kg	2,60E+01	0	0	2,60E+01	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0
FW	m <sup>3</sup>	-1,76E+00	2,40E-02	5,59E-01	-1,18E+00	9,51E-02	5,14E-03	7,53E-03	1,55E-01	0,00E+00	-3,63E+00
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of nonrenewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water										

## WASTE PRODUCTION AND OUTPUT FLOWS

### Waste production

Results per 1 ton of structural hollow sections											
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,99E-05	6,24E-04	7,58E-01	7,59E-01	2,24E-03	8,29E-07	1,70E-04	8,52E-04	0,00E+00	0,00E+00
Nonhazardous waste disposed	kg	6,46E+01	1,15E+01	7,59E+00	8,37E+01	6,06E+01	8,02E-03	6,15E+00	9,25E+00	0,00E+00	0,00E+00
Radioactive waste disposed	kg	1,73E-01	1,64E-03	5,99E-03	1,81E-01	6,91E-03	1,46E-05	4,83E-04	1,82E-03	0,00E+00	0,00E+00

### Output flows

Results per 1 ton of structural hollow sections											
Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	110	0	0
Material for recycling	kg	0	0	87,4	87,4	0	0	0	864	0	0
Materials for energy recovery	kg	0	0	0,922	0,922	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	110	0	0

## INFORMATION ON BIOGENIC CARBON CONTENT

Results per declared unit		
BIOGENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	1,95

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>.



## 6. Additional information – scenarios

### Transport to construction site (A4)

Parameter	Unit
Vehicle type	Lorry, >32 metric ton
Load capacity	37 % (ecoinvent 3.7)
Distance	Varies for different transportation countries
Bulk density	832 kg/m <sup>3</sup>

Parameter	Unit
Vehicle type	Ferry
Load capacity	65 % (ecoinvent 3.7)
Distance	Varies for different transportation countries
Bulk density	832 kg/m <sup>3</sup>

### End-of-life (C)

Parameter	Unit
Collection process	collected separately
Transportation	50 km road
Recovery system	89% recycled and 11% reused
Disposal	no disposal

### Recycling and reuse (D)

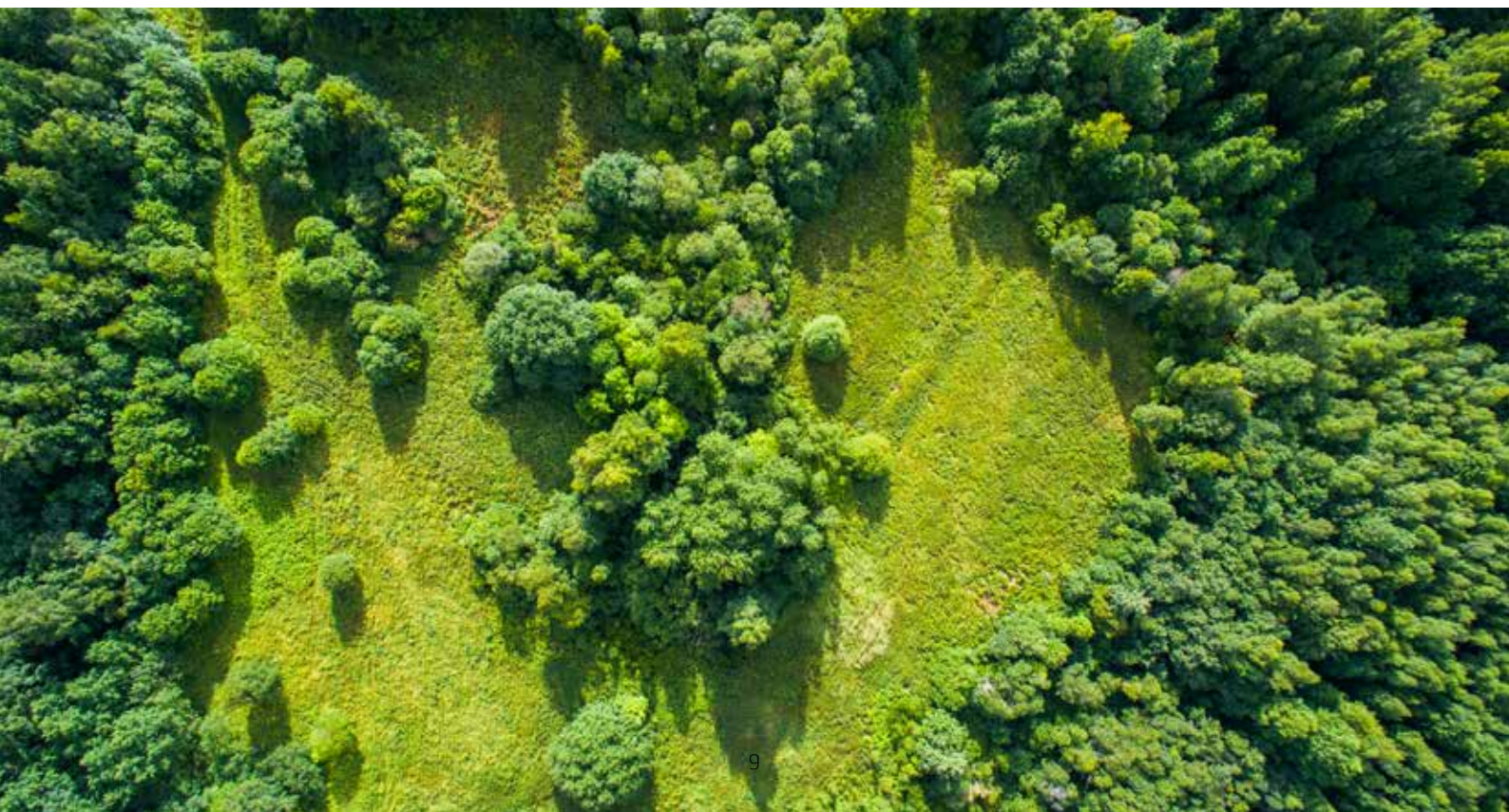
Module D is based on Worldsteel Recycling methodology. The methodology is presented more precisely in Worldsteel Association's Life Cycle Inventory methodology report. This is listed in the references at the end of this report.

Reuse of the product is assumed to substitute primary hot rolled steel production.

## 7. Differences versus previous versions

Co-product allocation has been added for steel scrap produced in modules A3 based on economic allocation. Sorting and pressing processes of steel waste have been added to module

C3. The values of module D have been updated according to Worldsteel recycling methodology. The results have been updated based on these changes.



## 8. Programme information

<b>Program</b>	The International EPD® System. EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden. www.environdec.com
<b>EPD registration number</b>	S-P-02241
<b>Published</b>	2020-09-14
<b>Revision date</b>	2022-01-13
<b>Valid until</b>	2025-08-28
<b>Product group classification</b>	UN CPC 4128
<b>Reference year for data</b>	2019
<b>Geographical scope</b>	Europe

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at [www.environdec.com](http://www.environdec.com)

<b>Core product category rules (c-PCR)</b>	CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
<b>Product category rules (PCR)</b>	PCR 2019:14 Construction products. Version 1.11. 2021-02-05. UN CPC code: 4128.
<b>PCR review was conducted by</b>	The Technical Committee of the International EPD® System. Chair: Claudia A. Peña. Contact via <a href="mailto:info@environdec.com">info@environdec.com</a>
<b>Independent third-party verification of the declaration and data, according to ISO 14025:2006:</b>	<input type="checkbox"/> EPD Process Certification (internal) <input checked="" type="checkbox"/> EPD Verification (external)
<b>Third party verifier</b>	Hannu Karppi Ramboll Finland Oy
<i>In case of recognised individual verifiers:</i>	
<b>Approved by</b>	The International EPD® System.
<b>Procedure for follow-up of data during EPD validity involves third party verifier</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction

products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

## 9. References

- General Programme Instructions of the International EPD® System. Version 4.0.
- PCR 2019:14 Construction products. Version 1.11. 2021-02-05.
- Ecobio Oy. 2022. LCA Report – SSAB Europe Oy’s Structural hollow sections, steel piles and precision tubes.
- Worldsteel Association. 2017. Life cycle inventory methodology report.

## 10. Contact information

<b>EPD owner</b>	SSAB Europe Oy Tubular Products FI – 13300 Hämeenlinna Finland  www.ssab.com  Juha Rajala
<b>LCA author:</b>	Ecobio Oy Malminkatu 16 00100 Helsinki Finland  www.ecobio.fi info@ecobio.fi
<b>Program operator</b>	EPD International AB info@environdec.com



SSAB is a Nordic and US-based steel company. SSAB offers value added products and services developed in close cooperation with its customers to create a stronger, lighter and more sustainable world. SSAB has employees in over 50 countries. SSAB has production facilities in Sweden, Finland and the US. SSAB is listed on the Nasdaq OMX Nordic Exchange in Stockholm and has a secondary listing on the Nasdaq OMX in Helsinki.